UNIVERSITY of GUELPH

COLLEGE of ENGINEERING AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

PhD Seminar 2

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CrowdMLP: Weakly-Supervised Crowd Counting via Multi-Granularity MLP

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Abstract:

Existing state-of-the-art crowd counting algorithms rely excessively on location-level annotations, which are burdensome to acquire. When only count-level (weak) supervisory signals are available, it is arduous and error-prone to regress total counts due to the lack of explicit spatial constraints. To address this issue, a novel and efficient counter (referred to as CrowdMLP) is presented, which probes into modelling global dependencies of embeddings and regressing total counts by devising a multi-granularity MLP regressor. In specific, a locally-focused pre-trained frontend is cascaded to extract crude feature maps with intrinsic spatial cues, which prevent the model from collapsing into trivial outcomes. The crude embeddings, along with raw crowd scenes, are tokenized at different granularity levels. The multi-granularity MLP then proceeds to mix tokens at the dimensions of cardinality, channel, and spatial for mining global information. An effective proxy task, namely Split-Counting, is also proposed to evade the barrier of limited samples and the shortage of spatial hints in a self-supervised manner. Extensive experiments demonstrate that CrowdMLP significantly outperforms existing weakly-supervised counting algorithms and performs on par with state-of-the-art location-level supervised approaches.